

Appl. No. 10/500,256

RCE SUBMISSION UNDER 37 CFR 1.114

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Listing of Claims:

Claims 1-11 (deleted)

12. (Currently amended) A salinity monitoring device for a well including a casing, the device being housed in the casing and comprising an electrical cable having a sheath containing a plurality of conducting wires therein, one end of each wire being connected to an electrode, and the other end of each wire being electrically coupled either to a measurement device or to an electrical current generator, ~~characterized in that~~ wherein the housing is formed from an electrically insulating material and includes apertures distributed on the major portion of its length, and ~~in that~~ wherein the spacing between consecutive electrodes is sufficiently large that electrical effect measured thereby are influenced by water surrounding the well beyond the casing in order to predict the arrival of a salt water front.
13. (Previously presented) The device of claim 12, wherein the spacing of the electrodes is greater than one meter.
14. (Previously presented) The device of claim 12, wherein one end of each wire is connected via a switching system either to the current generator or to the measurement device.
15. (Previously presented) The device of claim 13, wherein one end of each wire is connected via a switching system either to the current generator or to the measurement device.
16. (Previously presented) The device of claim 12, wherein the electrodes are secured on the outside of the cable.
17. (Previously presented) The device of claim 16, wherein the outside of the cable has a device for measuring the local salinity of water in the well located thereon.
18. (Previously presented) The device of claim 17, wherein the device for measuring local salinity comprises electrodes located inside a housing secured to the cable.
19. (Previously presented) The device of claim 18, wherein the electrodes for measuring local salinity are secured on the sheath of the cable.
20. (Previously presented) The device of claim 18, wherein the electrodes for measuring local salinity are secured to the housing.

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21. (Previously presented) The device of claim 16, wherein the device for measuring local salinity is secured to the cable by means of rings clamped on the cable, spokes being provided to secure the housing to the ring.

22. (New) A salinity monitoring method for a well including a casing comprising the steps of:

- housing a salinity monitoring device into the casing, the device comprising an electrical cable having a sheath containing a plurality of conducting wires, one end of each wire being connected to an electrode, and the other end of each wire being electrically coupled either to a measurement device or to an electrical current generator, the device further comprising two farthest electrodes and two intermediate electrodes, the housing being formed from an electrically insulating material and including apertures distributed on the major portion of its length,

- transmitting a current between the farthest electrodes,

- measuring the potential between the intermediate electrodes,

- determining an apparent measured resistivity based on the current, the potential and dimensions of the device,

wherein the spacing between consecutive electrodes is sufficiently large so that a variation in the apparent measured resistivity is influenced by water surrounding the well beyond the casing, and wherein the method further comprises predicting the arrival of a salt water front based on a drop in the apparent measured resistivity.